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Leconte

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(54) **HINGE MECHANISM AND VEHICLE SEAT COMPRISING SUCH A MECHANISM**

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B60N 2/22	(2006.01)
B60N 2/235	(2006.01)

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(58) **Field of Classification Search**

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USPC ..... 297/367 R
See application file for complete search history.

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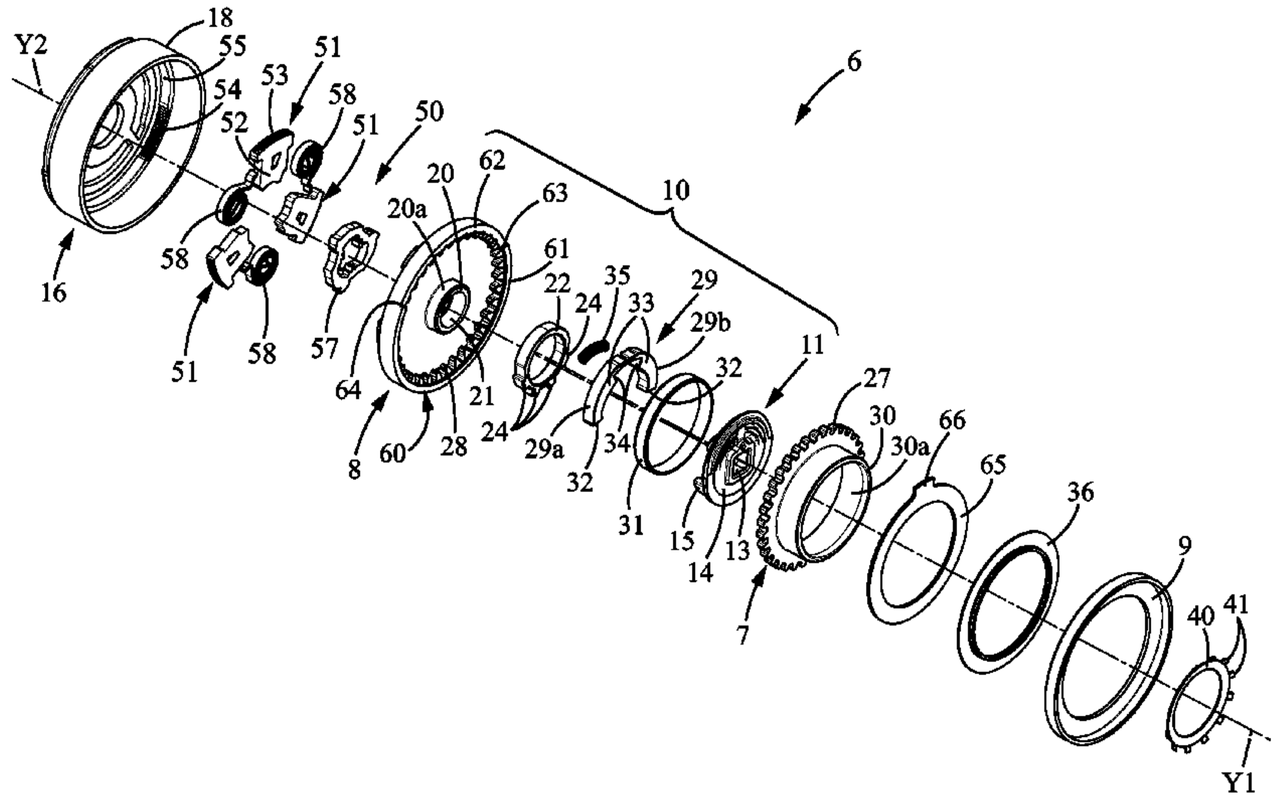
(57) **ABSTRACT**

Hinge mechanism comprising a first frame and a second frame mounted to rotate relative to one another and bounding an interior space, an adjustment device adapted to allow adjustment of the angular position between the first frame and second frame, a stop member integral with the first frame and arranged within the interior space, the stop member cooperating in abutment with the second frame to limit the relative rotation of the first frame and second frame between first and second angular end-of-travel positions. The stop member protrudes from the first frame.

10 Claims, 10 Drawing Sheets



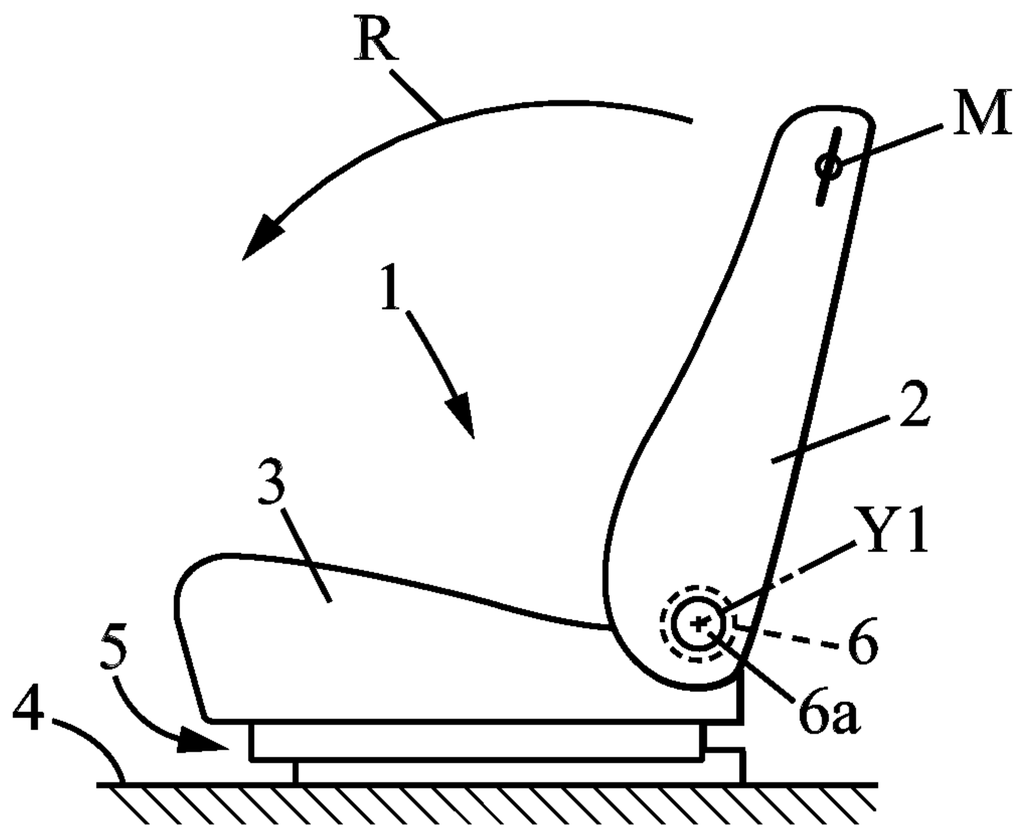


FIG. 1

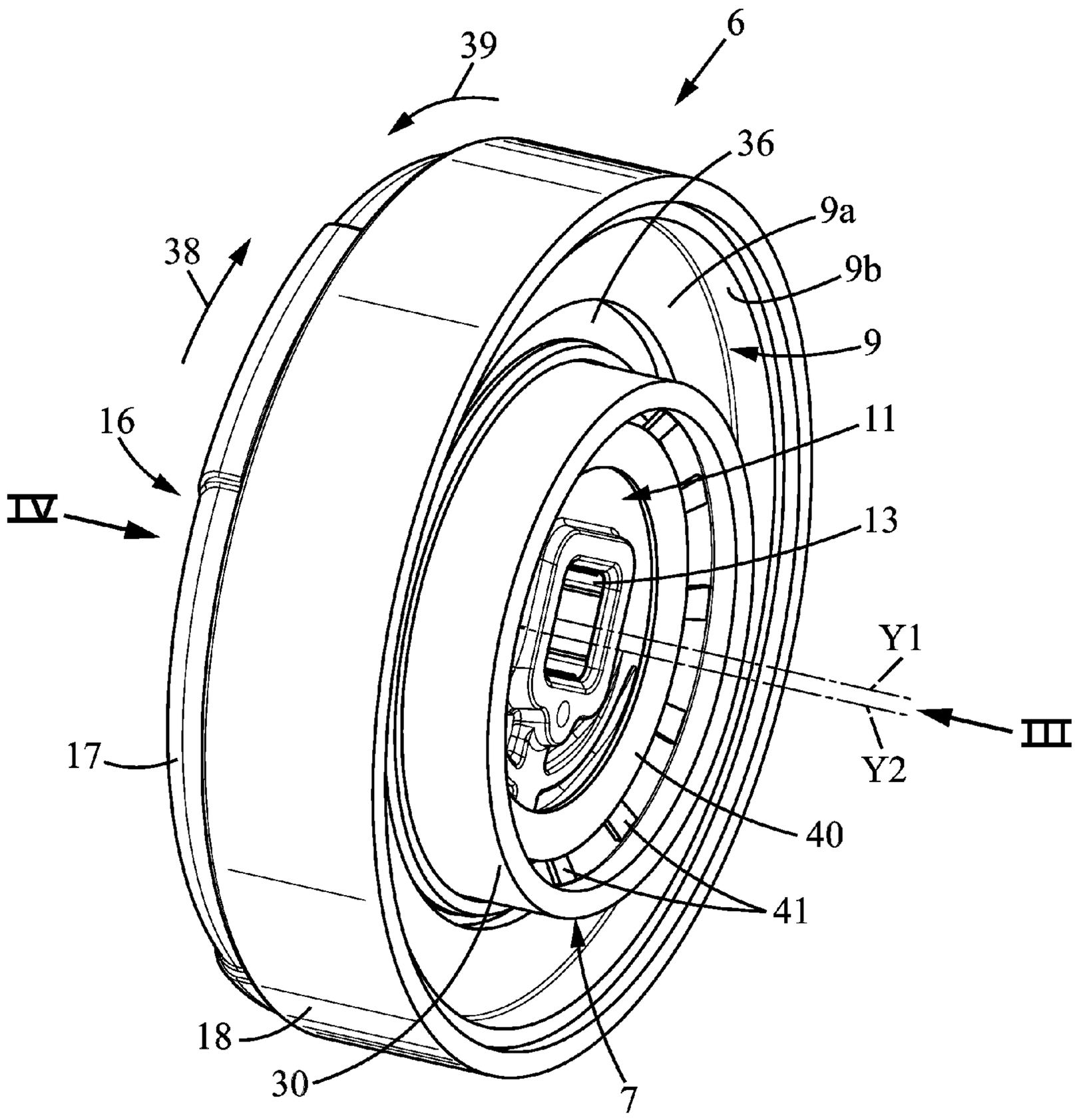
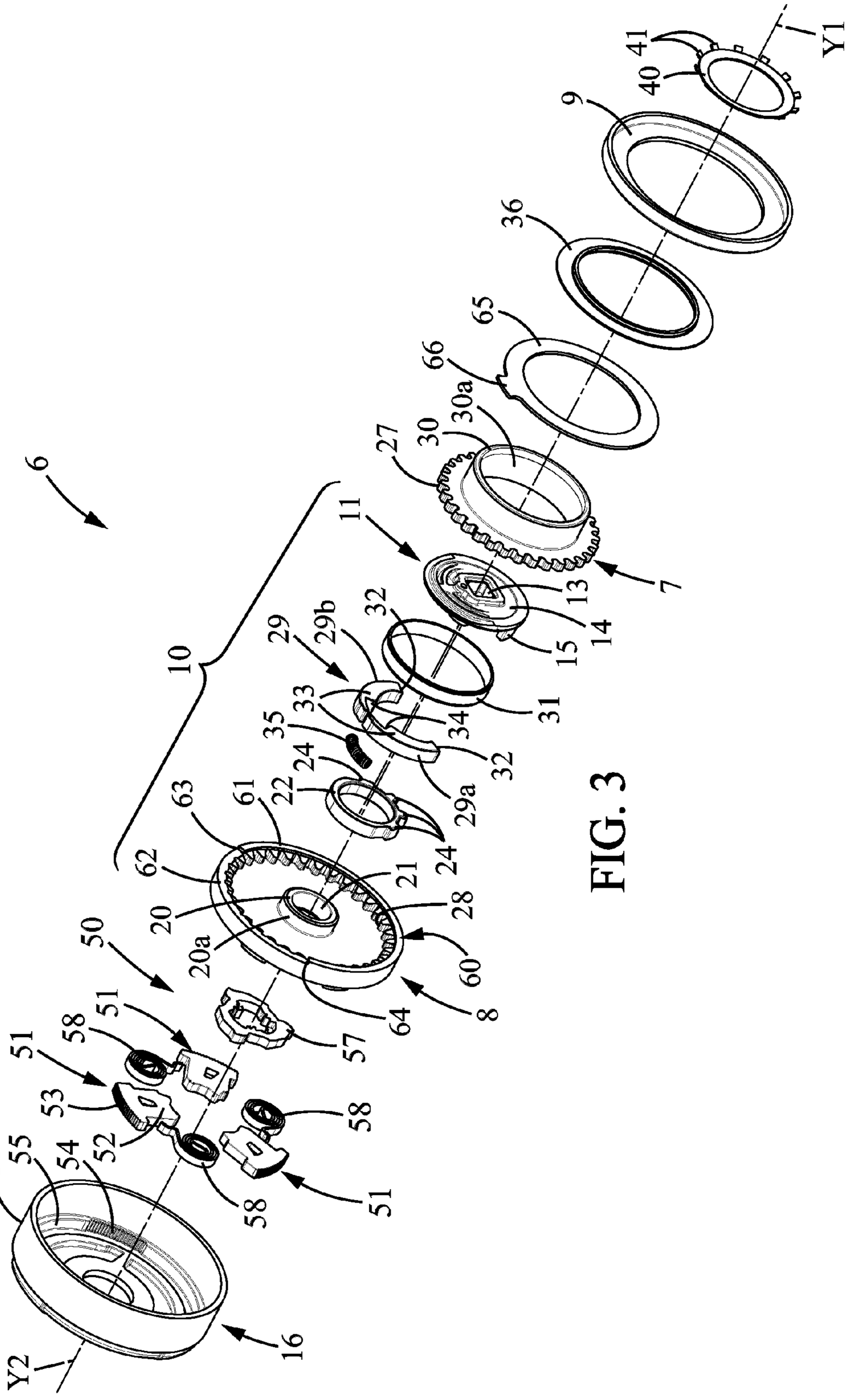


FIG. 2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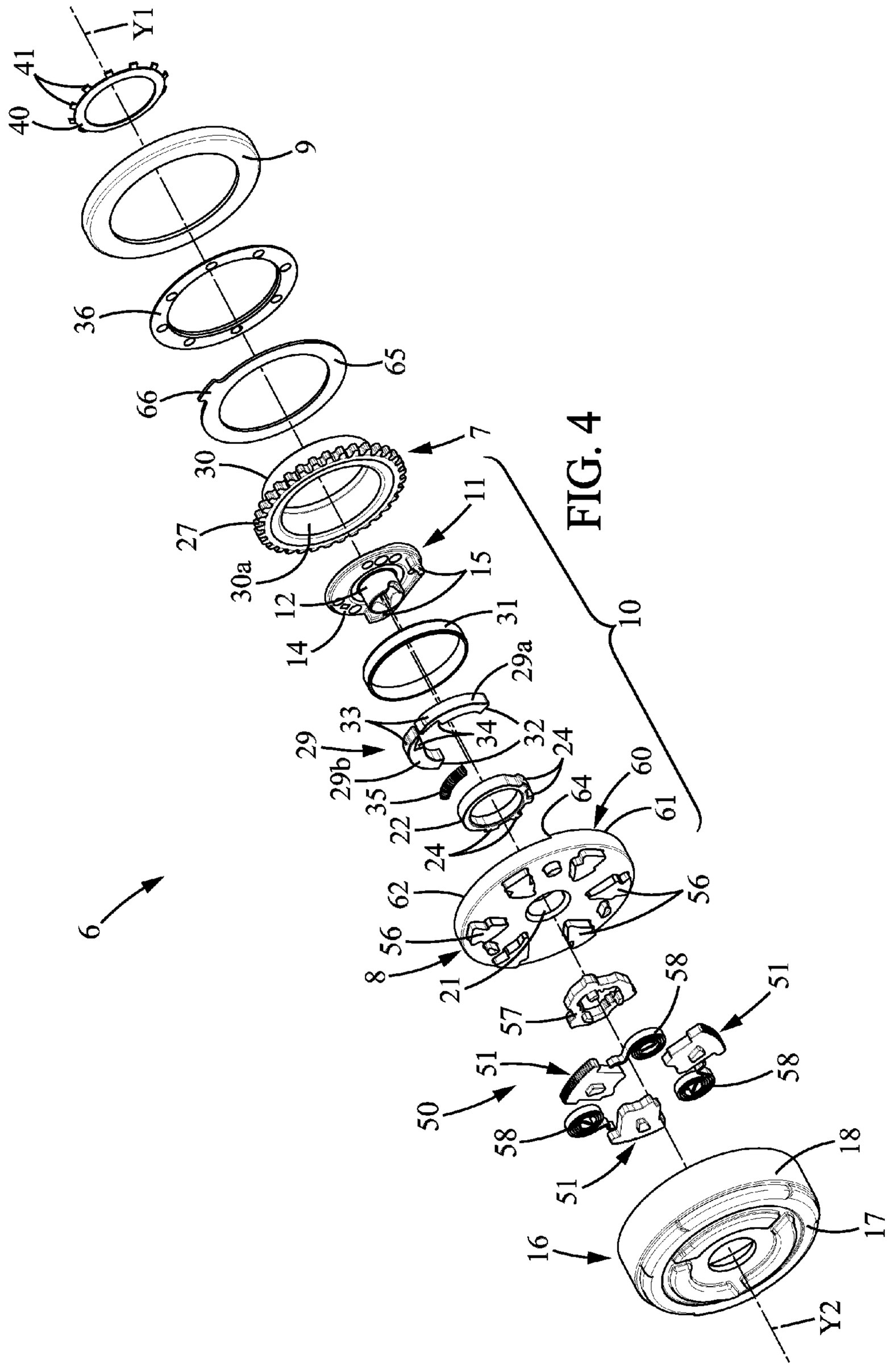
10
11
7
8
16
50
51
41
40
9
36
65
66
30a
30
27
13
14
15
32
31
29
29b
33
35
34
24
22
61
63
62
20
20a
21
28
60
64
57
58
53
52
54
55
18
Y1
Y2

FIG. 3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41
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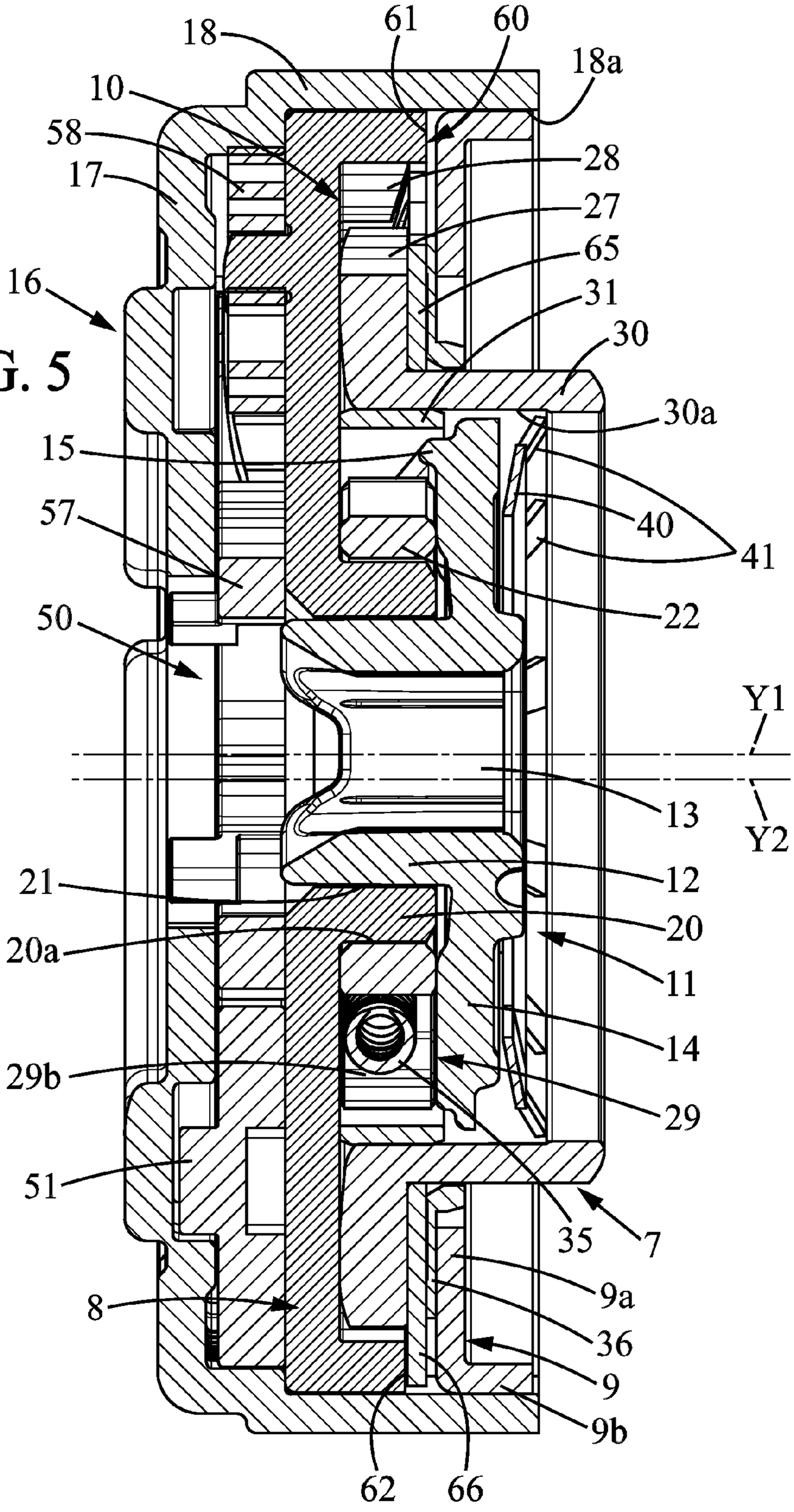
9
36
66
65
30
27
7
11
30a
15
12
14
31
10
29a
33
29
34
32
29b
24
35
22
60
64
61
24
62
56
56
8
21
57
58
51
51
58
50
58
51
18
16
17
Y2

FIG. 4

FIG. 5


18
61
60
18a
10
58
17
28
27
65
16
31
30
30a
15
40
41
57
22
50
Y1
13
Y2
21
12
20
20a
11
14
29b
29
51
35
7
9a
8
36
9
9b
62
66

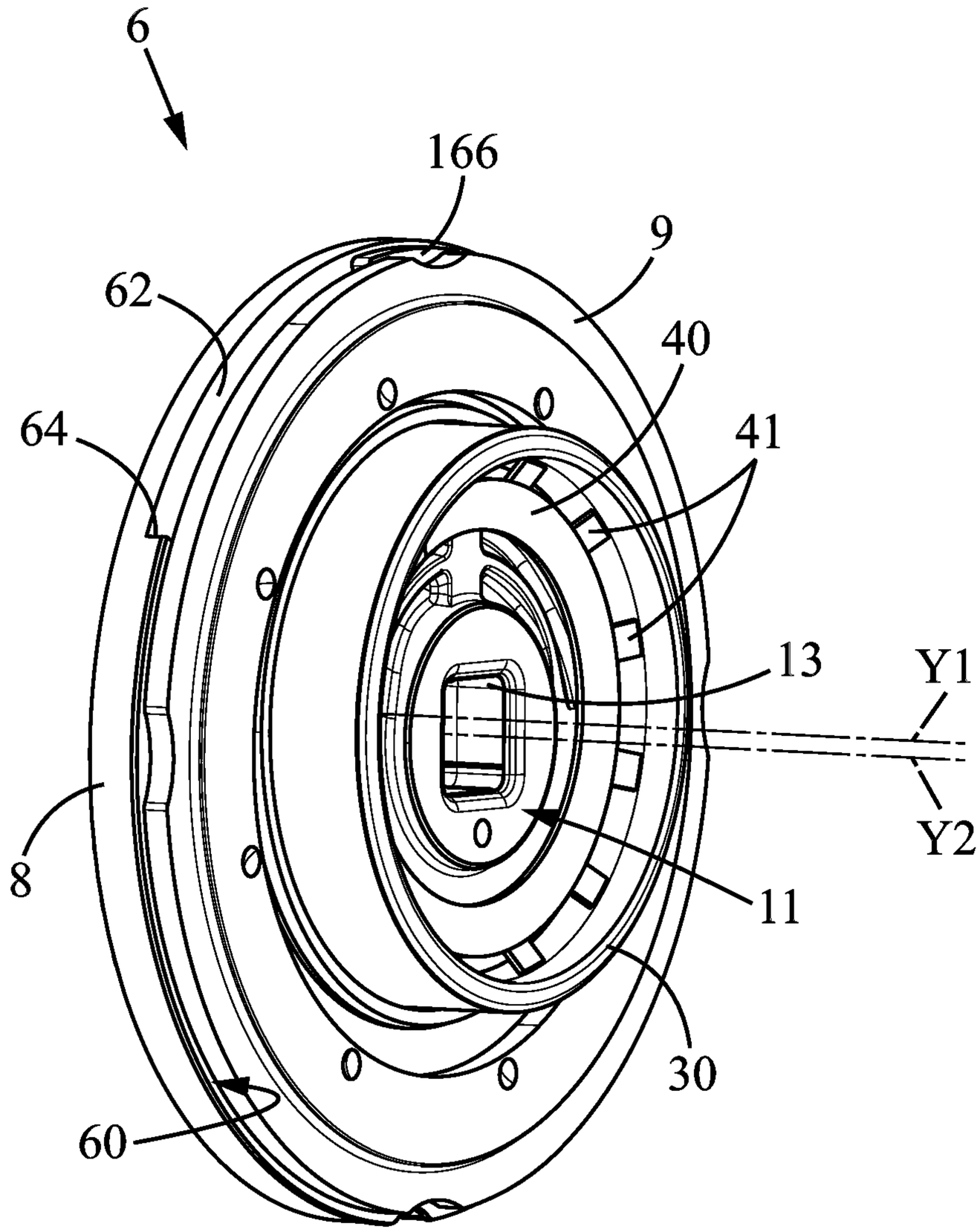


FIG. 6

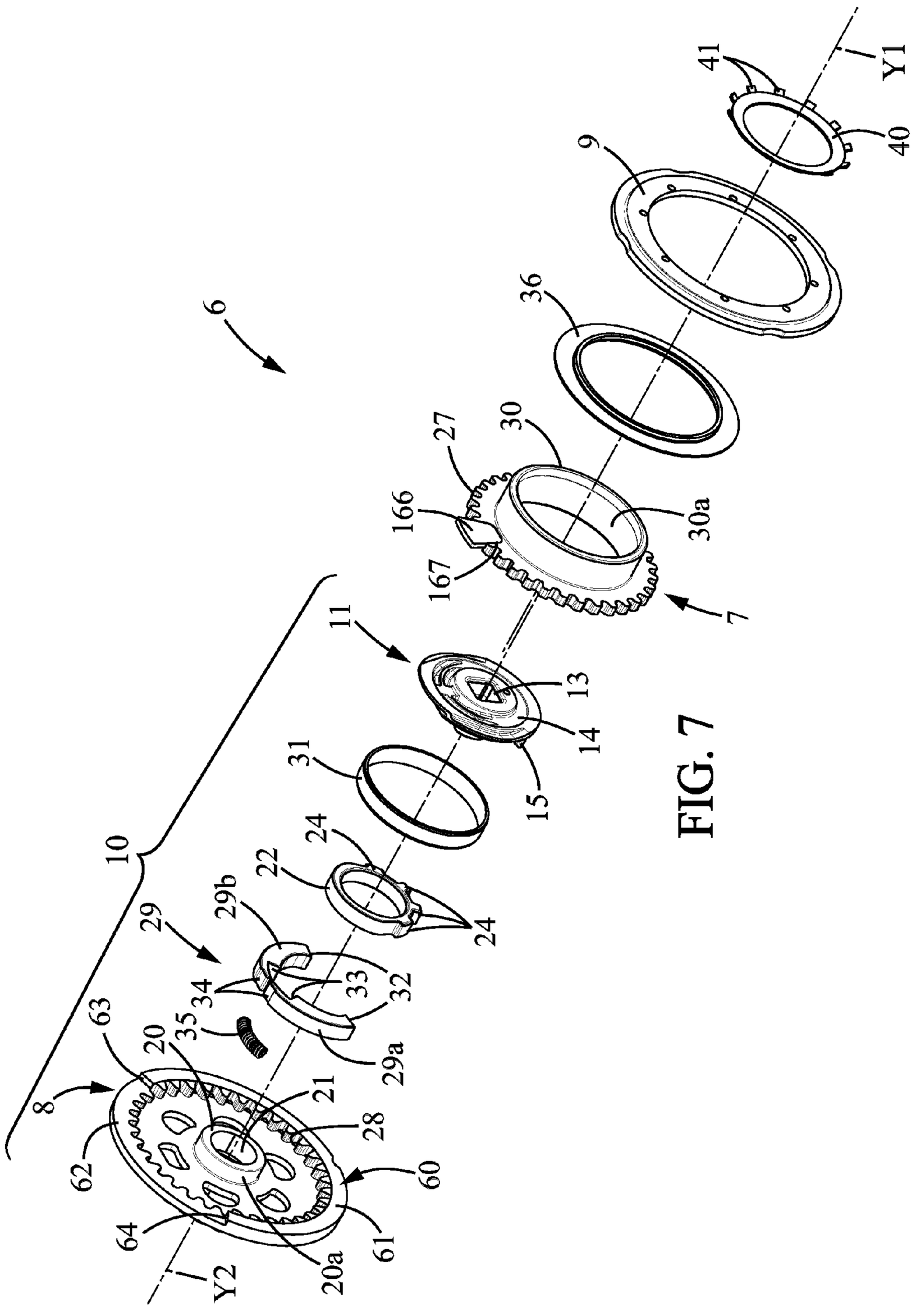

41
Y1
40
9
36
6
27
30
166
30a
167
7
11
13
14
31
15
10
24
22
29b
29
34
33
32
63
35
20
29a
8
21
28
62
60
64
61
20a
Y2

FIG. 7

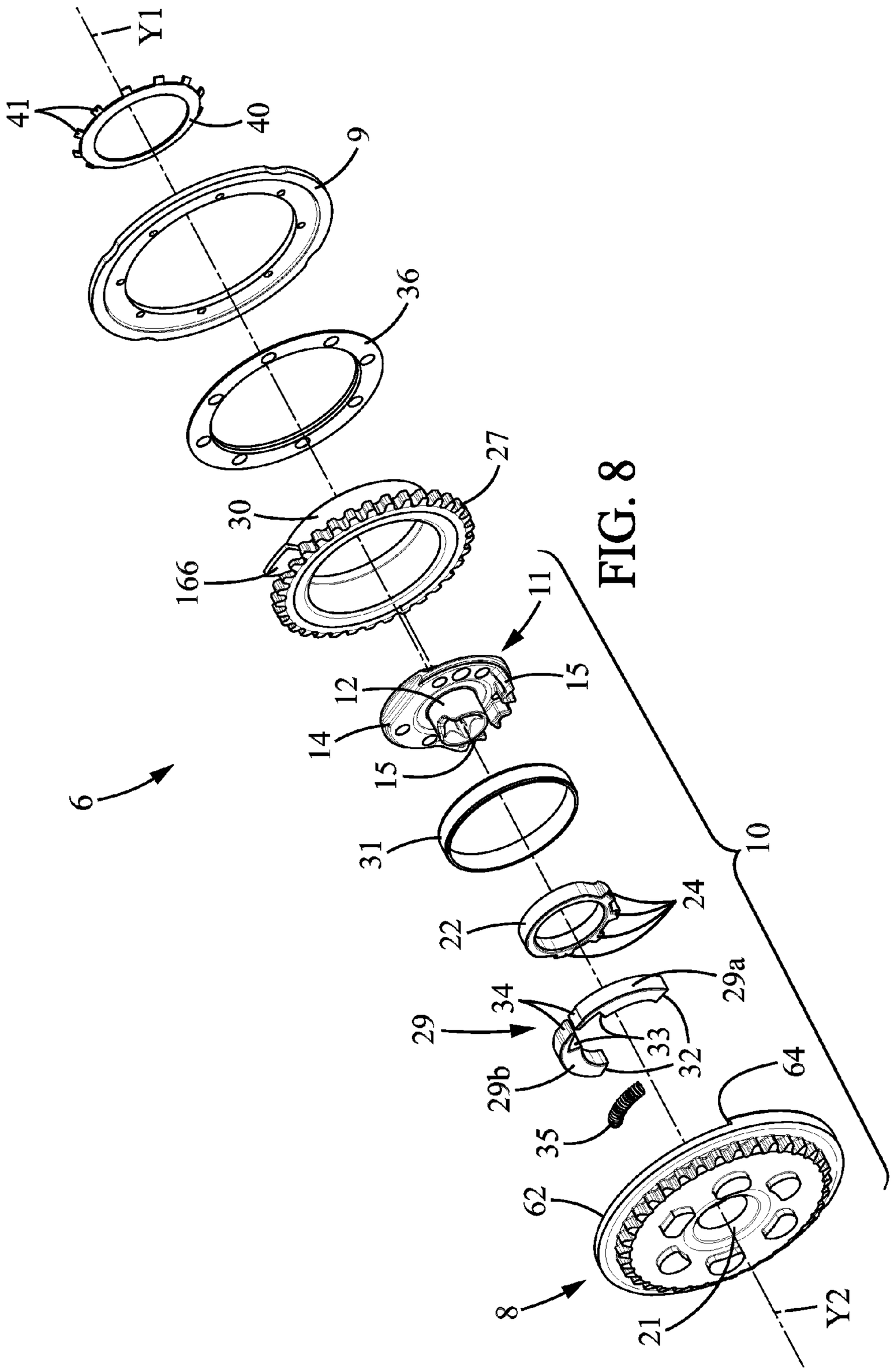
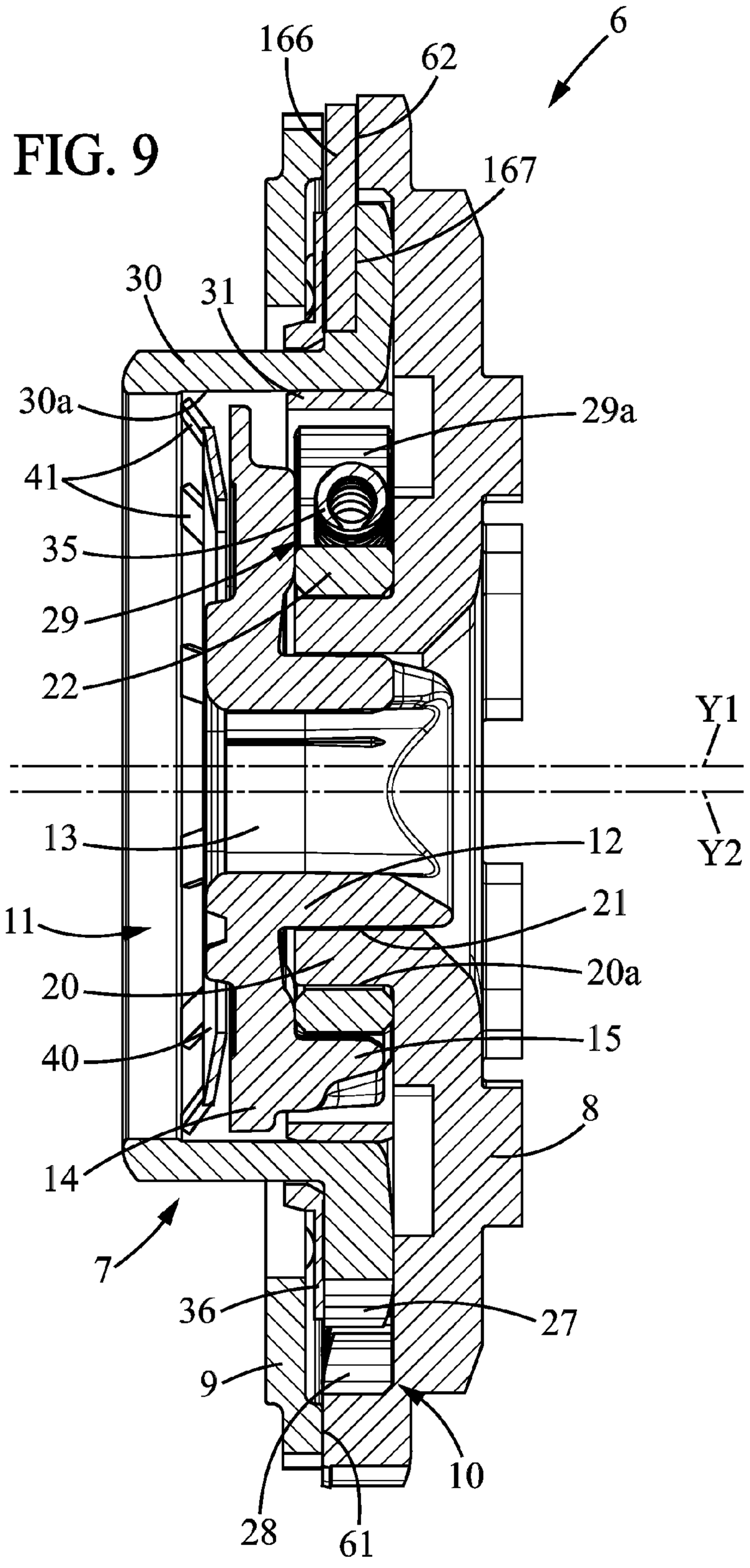

Y1
41
40
9
36
27
30
166
11
12
15
14
15
6
31
10
22
24
9a
34
29
33
32
29b
64
35
62
8
21
Y2

FIG. 8

FIG. 9


6
166
62
167
30
31
30a
29a
41
35
29
22
Y1
Y2
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7
36
27
9
10
28
61

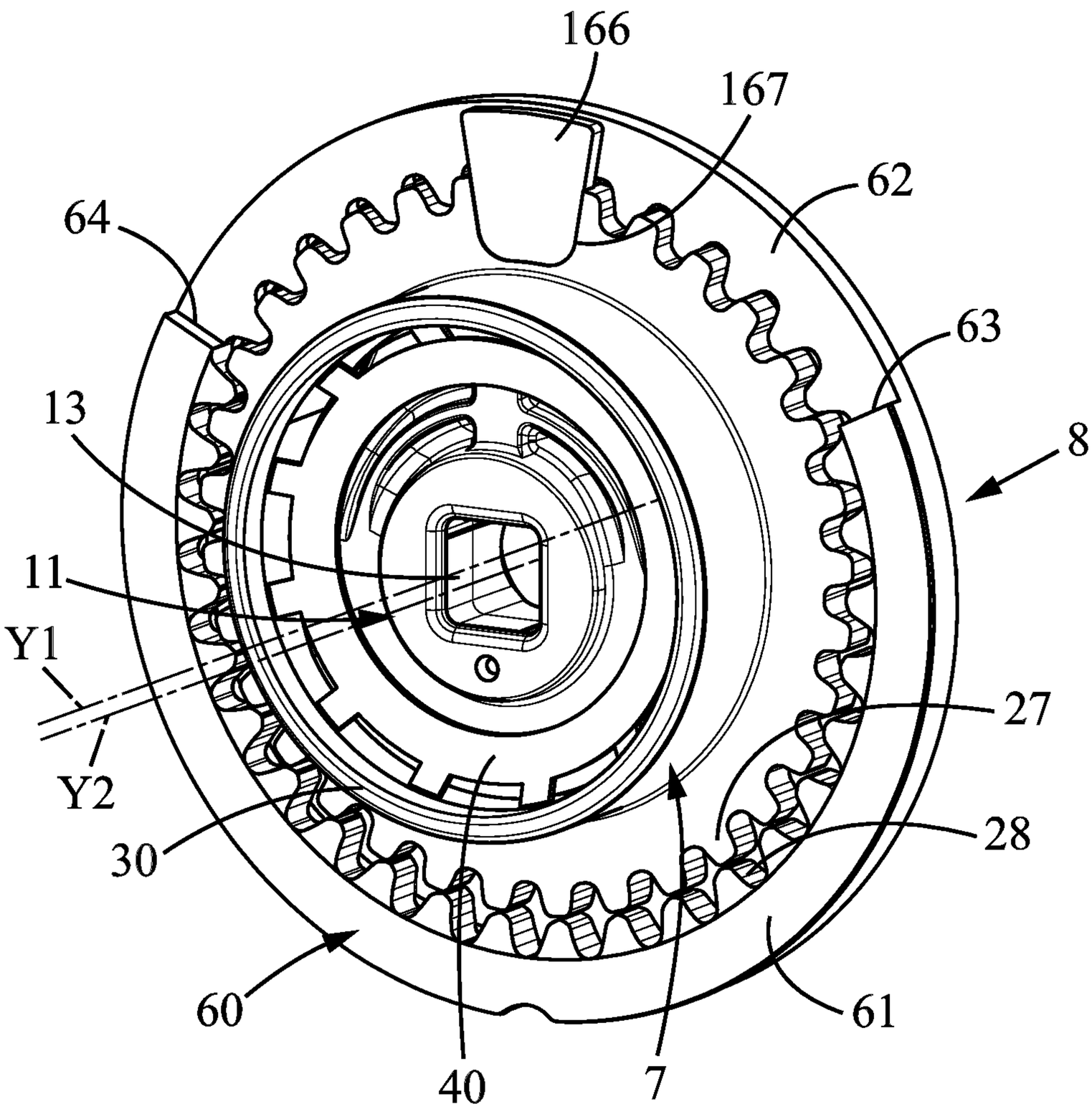

FIG. 10

HINGE MECHANISM AND VEHICLE SEAT COMPRISING SUCH A MECHANISM

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority under the Paris Convention to French Patent Application No. 14 51704 filed on Mar. 3, 2014.

FIELD OF THE DISCLOSURE

The present invention relates to hinge mechanisms and to vehicle seats comprising such mechanisms.

BACKGROUND OF THE DISCLOSURE

More specifically, a hinge mechanism may comprise:

- a first frame and a second frame mounted to rotate relative to one another about at least one axis of rotation and at least partially bounding an interior space,
- an adjustment device adapted to allow adjustment of the angular position between the first frame and second frame,
- a stop member integral with the first frame and arranged within the interior space, the stop member cooperating in abutment with the second frame to limit the relative rotation of the first frame and second frame between first and second angular end-of-travel positions.

Document WO-A-2013/010918 describes an example of a hinge mechanism of this type, in which the stop of the first frame is obtained by fine punching (referred to as "half shear") and the stop enters a window arranged in the second frame.

SUMMARY OF THE DISCLOSURE

The hinge mechanism described in that document has the disadvantage of requiring a special tool for this particular application, which raises the cost of the hinge mechanism.

The present invention is intended to overcome these disadvantages.

To this end, the invention provides a hinge mechanism comprising:

- a first frame and a second frame mounted to rotate relative to one another about at least one axis of rotation and at least partially bounding an interior space, the second frame comprising an annular rim at least partially receiving the first frame and having an axial end face,
- an adjustment device adapted to allow adjustment of the angular position between the first frame and second frame,
- a stop member protruding from the first frame and at least partially arranged within the interior space, the stop member cooperating in abutment with the second frame to limit the relative rotation of the first frame and second frame between first and second angular end-of-travel positions,

wherein the axial end face of said annular rim comprises a stepped-down recess in only a portion of the axial thickness of the annular rim and extending angularly between two shoulders, said recess forming a guide track along a circular arc contained in a radial plane and extending angularly between two shoulders forming counter-stops,

and wherein the stop member extends in a radial plane in immediate proximity to the radial plane containing the guide track, said stop member projecting radially to said guide track, such that the stop member is mounted to move along said guide track and is adapted to cooperate with said counter-stops to limit the relative rotation of the first frame and second frame between the first and second angular end-of-travel positions.

This avoids the disadvantages described above.

In addition, the above arrangements do not increase the footprint of the hinge mechanism and have little or no impact on the internal architecture of the hinge mechanism, which makes this design possible in many types of existing hinge mechanisms.

It is equally possible to use the first and second frames in:

- applications requiring the first and second stop positions, in which case the stop member is mounted on the first frame,
- or in applications not requiring the first and second stop positions, in which the stop member is simply omitted.

In addition, it is possible to vary the first and/or second stop position from one model to another of the hinge mechanism, using stop members of different shapes, and doing so with the same first and second frames.

In various embodiments of the hinge mechanism according to the invention, one or more of the following arrangements may possibly be used:

- the first frame comprises a first set of teeth, in particular directed radially outward, and the second frame comprises a second set of teeth formed in the annular rim, in particular directed radially inward, the first set of teeth meshing with the second set of teeth in a radial plane containing the guide track in order to adjust the relative angular position between the first frame and second frame;
- the stop member is in the form of a pin projecting radially outward, formed as an integral part of a radial ring;
- the radial ring is integral to the first frame;
- the first frame comprises an axial neck and the flat radial ring engages with and/or is attached to the axial neck;
- the stop member is a wedge secured within a housing provided in the first frame;
- the stop member is a wedge secured within a housing provided in the first frame and the housing is formed at the periphery of the first frame in only a portion of the thickness of the first set of teeth.

The invention also relates to a vehicle seat comprising first and second parts connected to each other by a hinge mechanism as defined above, the first and second frames being attached one to the first part and the other to the second part. It is possible for one of the first and second seat parts to be a seating part and the other to be a backrest.

Of course, the different features, variants, and/or embodiments of the present invention can be associated with each other in various combinations as long as they are not incompatible or mutually exclusive.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be better understood and other features and advantages will become apparent upon reading the following detailed description of some embodiments provided for illustrative purposes with reference to the accompanying figures, presented as non-limiting examples, which can serve to provide a better understanding of the invention and its implementation and, where appropriate, contribute to its definition, where:

FIG. **1** is a schematic side view of a vehicle seat which can be equipped with a hinge mechanism according to the invention,

FIG. **2** is a perspective view of the hinge mechanism equipping the seat of FIG. **1**, in a first embodiment of the invention,

FIGS. **3** and **4** are exploded perspective views of the hinge mechanism of FIG. **2**, respectively viewed in directions III and IV of FIG. **2**,

FIG. **5** is an axial sectional view of the hinge mechanism of FIG. **2**,

FIGS. **6** to **9** are views respectively similar to FIGS. **2** to **5**, for a second embodiment of the invention, and

FIG. **10** is a perspective view of a portion of the hinge mechanism of FIGS. **6** to **9**.

DETAILED DESCRIPTION

In the various figures, the same references denote identical or similar structural and/or functional elements in the various embodiments. Unless otherwise indicated, such elements may therefore have identical structural, dimensional and material properties.

For clarity, only those elements necessary for understanding the described embodiments have been represented and described in detailed.

FIG. **1** is a schematic side view of a vehicle seat **1**, preferably a front seat **1**, that can be equipped with a hinge mechanism **6** according to the invention, and shows the seat **1** comprising a backrest **2** mounted to pivot about a pivot axis Y**1**, or first axis Y**1**, on a seating part **3**, said seating part **3** in turn being mounted on the vehicle floor **4**, for example on slide rails **5**.

The angle of the backrest **2** is thus manually adjustable by means of a control knob **6***a*, in particular a rotating control knob **6***a* or similar arrangement which drives the hinge mechanism **6**, in particular a gear mechanism providing positive control of the rotation of the backrest **2**.

In the example considered here, the backrest **2** can also be angled forward in a counterclockwise direction R (or possibly backwards in the opposite clockwise direction), for example in order to fold it flat or to access the rear seating in the vehicle, by actuating a lever M, in particular located at the top of the backrest **3**, which controls a seat angle position control that is part of the hinge mechanism **6**.

A first embodiment of the hinge mechanism **6** is represented in FIGS. **2** to **5**, which are respectively a perspective view, exploded perspective views in respective directions III and IV of FIG. **2**, and an axial sectional view of a hinge mechanism **6** that can equip the seat **1** of FIG. **1** in a first embodiment of the invention.

The hinge mechanism **6** according to the first embodiment comprises a first frame **7** formed, for example, by a first disc-shaped metal plate centered on the first axis Y**1**, extending in a plane perpendicular to the first axis Y**1**. The first frame **7** can be, for example, secured to a structural member of the seating part **3**.

The hinge mechanism **6** further comprises a second frame **8** formed, for example, by a generally disc-shaped metal plate centered on a second axis Y**2** parallel to the first axis Y**1** but offset relative thereto.

The second frame **8** is parallel to the first frame **7** and placed so as to abut axially against it, the first frame **7** and the second frame **8** being connected together by a locking ring **9** which will be described below and which, together with the first frame **7** and second frame **8**, forms a closed housing defining an interior space of the hinge mechanism **6**.

The second frame **8** may be connected, for example, to a structural member of the backrest **2**, directly or by means of an reclining frame **16** in the current example which will be described below.

The first frame **7** and second frame **8** are connected together by an adjustment device **10** arranged within the interior space of the hinge mechanism **6**. Advantageously, the adjustment device **10** allows adjusting the relative angular position between the first frame **7** and second frame **8**, for example by means of the control knob **6***a*.

In the example considered here, the adjustment device **10** is a hypocycloid gear mechanism driven by a device comprising an input member **11** and an eccentric cam.

The input member **11**, visible in FIGS. **2-7**, may, for example, be a single part molded of plastic or light alloy. The input member **11** comprises a central shaft **12** extending longitudinally along the second axis Y**2**, or central axis Y**2**.

The central shaft **12** may possibly be pierced by an inner recess **13**, preferably square, splined, or other, into which a shaft **6***a* integral to the control knob can fit.

The central shaft **12** extends radially outward at its end furthest from the second frame **8**, as a flange **14** extending parallel to the first frame **7** and second frame **8**.

An inner face of the flange **14** is extended toward the hypocycloid gear mechanism by at least one driving pin **15**, in the current case two driving pins **15**, which extends parallel to the second axis Y**2** toward the second frame **8**, its usefulness to be discussed below.

The shape of the central shaft **12** is a right circular cylinder centered on the second axis Y**2** and turning on a bearing integral to the second frame **8** and also centered on the second axis Y**2**. The integral bearing is here formed by a cylindrical through-hole **21** formed in the second frame **8** and in a neck **20** which is integral to the second frame **8**. The neck **20** may, for example, be formed as one piece with the second frame **8** and extend axially from the second frame **8** toward the first frame **7**.

The input member **11** is rotatably connected to the eccentric cam which, in the current example, extends perpendicularly to the first axis Y**1** and is driven by the input member **11**. The eccentric cam turns about the neck **20** in a housing **30***a*, preferably a right circular cylindrical housing **30***a*, integral with the first frame **7** and traversing the first frame **7**. The housing **30***a* is centered on the first axis Y**1**. The housing **30***a* is delimited in particular by a neck **30**, particularly a metal neck **30**, integral with the first frame **7**.

The eccentric cam may comprise a control ring **22** and a clearance adjustment assembly **29**.

The control ring **22** turns on an external cylindrical surface **20***a* of the neck **20** and is at least partially surrounded by the clearance adjustment assembly **29**.

In addition, the control ring **22** is eccentric relative to the second axis Y**2** in the example considered here. However, the control ring **22** could be centered on the second axis Y**2**.

In the embodiment shown, the clearance adjustment assembly **29** comprises at least one cam portion **29***a*, here two cam portions **29***a*, **29***b*, preferably of metal, in the form of wedges arranged facing an external peripheral surface, forming a right circular cylinder, of the control ring **22**.

The cam portion **29***a*, or cam portions **29***a*, **29***b*, comprises a first end **32** having a minimum radial thickness and a second end **33** having a maximum radial thickness.

According to the example shown, the two ends **33** of the cam portions **29***a*, **29***b* are adjacent to one another, and respectively comprise a notch **34** facing one another, which receive a spring **35** biasing the cam portions **29***a*, **29***b* away

from one another, or in other words towards a position of maximum eccentricity of the eccentric cam.

The control ring **22** further comprises external teeth **24**, in particular four external teeth **24**, between the first ends **32** of the cam portions **29***a*, **29***b*.

In the described arrangement comprising four external teeth **24**, the two outer teeth **24** closest to the cam portions **29***a*, **29***b* additionally define shoulders respectively facing the first ends **32** of the cam portions **29***a*, **29***b*. However, in the rest state, some clearance exists between each shoulder and the first end **32** of the corresponding cam portion **29***a*, **29***b*. The driving pins **15** of the input member **11** substantially fit with the shoulders defined by the external teeth **24**.

The control ring **22** just described is particularly suitable for a manual hinge mechanism, meaning a mechanism actuated by a manual control, in particular by the control knob **6***a*.

However, the present invention also covers a motorized hinge mechanism. In such a configuration, the input member **11** acts on the eccentric cam.

Conversely, in a manual configuration the input member **11** acts on cam portions **29***a*, **29***b*.

One will note that it is possible to replace the eccentric cam with a cam having two disc-shaped parts, known from the prior art.

The hypocycloid gear mechanism here is a single-train gear that comprises for example:

- a first set of teeth **27**, preferably a first circular set of teeth **27**, centered on the first axis Y**1**, oriented radially outward and formed at the periphery of the first frame **7**, preferably formed as a single piece with the first frame **7**, such that the first frame **7** thus comprises a ring gear, and
- a second set of teeth **28**, preferably a second circular set of teeth **28**, formed on the inner face of the second frame **8**, oriented radially inward, centered on the second axis Y**2** and having an inside diameter greater than the outside diameter of the first set of teeth **27**.

The first set of teeth **27** and the second set of teeth **28** are contained within the same radial plane.

Where appropriate, a bushing **31** forming a bearing may be interposed between the eccentric cam and the housing **30***a* integral to the first frame **7** and traversing the first frame **7**. Preferably, the bushing **31** is press-fitted into the housing **30***a*.

The hinge mechanism **6** may further comprise a locking ring **40**, preferably of metal, which retains the hub of the hinge mechanism **6** within the neck **30**. The locking ring **40** is fixed within the housing **30***a* integral to the first frame **7**, against the input member **11**, by any known means and in particular by press-fitting, for example by means of peripheral tabs **41** press-fitted into the neck **30**. The peripheral teeth **41** which here project outward are elastically braced against an inner surface of the neck **30**, with the peripheral teeth **41** extending obliquely outward radially and away from the second frame **8**.

The hinge mechanism **6** further comprises a stop member **66**, preferably integral to the first frame **7** and protruding therefrom. The stop member **66** is arranged within the interior space defined by the first frame **7** and second frame **8**. The stop member **66** cooperates in abutment with the second frame **8** to restrict the relative rotation of the first frame **7** and second frame **8** during adjustment between first and second angular end-of-travel positions of the hinge mechanism **6**.

The stop member **66** has, for example, in the form of a finger projecting radially outward, formed as one piece with a radial ring **65** in particular a ring fitted around the neck **30** of the first frame **7**, preferably from a piece of sheet metal.

More specifically, the radial ring **65** is retained on the neck **30** of the first frame **7** by welding or other methods such as riveting, crimping, etc.

In addition, the radial ring **65** is in contact with an axial face of the first set of teeth **27** on the side opposite the second frame **8**. The radial ring **65** is also in sliding contact with a corresponding axial face of the second set of teeth **28**, or in immediate proximity to a corresponding axial face of the second set of teeth **28**, which is facing away from the second frame **8**.

The second set of teeth **28** is formed inside an annular rim **60** of the second frame **8** which protrudes toward the first frame **7**. The annular rim **60** has an end face **61** with a stepped-down recess **62** angularly delimited between two shoulders **63**, **64**. The recess is in the radial plane of the first set of teeth **27** and second set of teeth **28**.

The stop member **66** protrudes radially and slides axially against the shoulder **62**, or in immediate proximity to the recess **62**, which thus forms a track defining a circular arc to guide the stop element **66**.

The shoulders **63**, **64** form counter-stops cooperating with the stop member **66** to angularly limit the relative pivoting of the first frame **7** and second frame **8** during adjustment of the relative angular position between the first frame **7** and second frame **8**.

The reclining frame **16** may be formed by a disc-shaped flange **17**, in particular a metal flange **17**, centered on the second axis Y**2**. The periphery of the flange **17** is extended axially along the second axis Y**2** by a peripheral ring **18**, preferably having the shape of a right circular cylinder centered on the second axis Y**2** and at least partially surrounding the first frame **7**, the second frame being arranged within the peripheral ring **18** of the reclining frame **16**.

The reclining frame **16** may be connected to the second frame **8** by a reclining device **50** operable, for example, by the knob M. However, the reclining device **50**, reclining frame **16**, and knob M could be omitted, in which case the second frame **8** is directly connected to one of the structural components of the seat **1**, for example a structural component of the backrest **2**.

The reclining device **50** may, for example, comprise locking knobs **51**, particularly of metal, the current example having three of them angularly distributed about the second axis Y**2**, for example every 120°.

Each of the locking knobs **51** may comprise a body **52** and an external set of teeth **53** which, in the normal usage position, respectively engages a corresponding toothed area **54** formed radially inside the peripheral ring **18** of the reclining frame **16**, in the vicinity of the flange **17**. The toothed areas **54** may be arranged every 120° and separated by smooth guide tracks **55** forming a circular arc, centered on the second axis Y**2** and oriented radially inward.

The locking knobs **51** are radially guided to slide in guides **56** formed in the second frame **8**, and are normally kept engaged with the toothed areas **54** by a cam **57** elastically biased toward a locked position by at least one spring **58**. The cam **57** is integral, for example, to a lever arm (not shown) connected, in particular by a cable (not shown), to the control lever M, such that actuating the lever M moves the cam **57** to an unlocked position which disengages the locking knobs **51** from the toothed areas **54**.

The locking ring **9** may have, for example, the shape of a right circular cylinder having an L-shaped cross-section, with a central portion **9***a* positioned substantially radially relative to the first axis Y**1** and second axis Y**2**, and an axial

peripheral rim **9***b* extending away from the adjustment device **10**. The axial peripheral rim **9***b* fits without play and is retained radially, in particular welded, against an inner surface **18***a* of the peripheral ring **18** of the second frame **8**.

The hinge mechanism **6** may further comprise a slide ring **36**, made for example of synthetic material, in particular Teflon® or other material, interposed axially between the first frame **7** and the locking ring **9**. The slide ring **36** provides easy rotation between the first frame **7** and second frame **8**.

The hinge mechanism **6** which has just been described operates as follows.

When a user actuates the control knob **6***a* to adjust the angle of the backrest **2**, one of the driving pins **15** of the input member **11** abuts against the first end **32** of one of the cam portions **29***a*, **29***b* and drives it angularly to compress the spring **35**. This has the effect of decreasing the offset of the eccentric cam.

As the movement continues, the cam portion **29***a*, **29***b* displaced by the driving pin **15** then drives the other cam portion **29***a*, **29***b*, by means of the spring **35** and/or by the second ends **33** of the cam portions **29***a*, **29***b* pressing together, such that the eccentric cam rotates within the bushing **31**, which rotates the first axis Y**1** about the second axis Y**2** in a first angular direction **38**. In the present description, the first axis Y**1** and second axis Y**2** are axes of rotation.

This results in rotation of the first set of teeth **27** within the second set of teeth **28**, pivoting the backrest **2**. The pivoting is angularly limited by cooperation between the stop member **66** and shoulders **63**, **64**.

When a user wants to fold down the backrest **2**, the user can operate the control lever M which unlocks the reclining device **50**, allowing the locking knobs **51** to disengage from the toothed areas **54**. The backrest **2** can then rotate freely, for example about 120°, even if the lever M is released, as the locking knobs **51** are then facing the guide tracks **55**.

When the user wants to return the backrest to the normal position, with optional actuation of the lever M, the locking knobs **51** then lock themselves in their locked positions within the toothed areas **54** where they were originally located.

FIGS. **6** to **9** are views respectively similar to FIGS. **2** to **5** for a second embodiment of the invention, and figure is a perspective view of a portion of the hinge mechanism **6** of FIGS. **6** to **9**.

The second embodiment of the invention, represented in FIGS. **6** to **10**, essentially differs from the previously described first embodiment in that:

- the hinge mechanism **6** has no reclining device **50** or reclining frame **16**, the second frame **8** being, for example, attached to the backrest **2** frame and the seat **1** not having a recline control lever M in such case;
- the first frame **7** and second frame **8** are not assembled by the locking ring **9**, but are assembled by a metal ring welded to the end face **61** of the annular rim **60** of the second frame **8**;
- the hinge mechanism **6** does not comprise the stop member **66** and ring **65**, but a stop member **166** in the form of a wedge fixed to the first frame **7**, for example by press-fitting and/or welding it.

As in the first embodiment, the annular rim **60** of the second frame **8**, in which is formed the second set of teeth **28**, includes the recess **62** extending angularly between the two shoulders **63**, **64**. The second set of teeth **28** here extends axially to the end face **61** of the annular rim **60** so that the recess **62** fits with a portion of the second set of teeth **28** of reduced axial thickness.

The stop member **166**, preferably made of sheet metal, extends radially. The stop member **166** fits into a housing **167** of complementary shape recessed in an axial face of the first frame **7** facing away from the second frame **8**. In addition, the housing **167** is formed at the periphery of the first frame **7**, in only a portion of the axial thickness of the first set of teeth **27**. Preferably, the second set of teeth **28** is therefore of reduced thickness along the guide track **62**.

More specifically, the stop member **166** is retained by welding or other methods such as riveting, crimping, etc.

The stop member **166** protrudes outwardly from the first set of teeth **27**, into the free space between the recess **62** and the locking ring **9**, such that the stop member **66** is guided between these two elements.

The operation of the second embodiment of the invention is identical to what was described above for adjusting the angle between the first frame **7** and second frame **8**.

The invention is, of course, not limited to the embodiments described above and provided solely as an example. It covers various modifications, alternative forms, and other variants envisaged by a person skilled in the art within the context of the invention, particularly any combination, separately or in combination, of the various modes of operation described above.

The invention claimed is:

1. A hinge mechanism comprising:

a first frame and a second frame mounted to rotate relative to one another about at least one axis of rotation and at least partially bounding an interior space, the second frame comprising an annular rim at least partially receiving the first frame and having an axial end face,

an adjustment device adapted to allow adjustment of the angular position between the first frame and second frame,

a stop member distinct from the first frame and fixed to the first frame, said stop member being at least partially arranged within the interior space, the stop member cooperating in abutment with the second frame to limit the relative rotation of the first frame and second frame between first and second angular end-of-travel positions,

wherein the axial end face of said annular rim comprises a stepped-down recess in only a portion of an axial thickness of the annular rim and extending angularly between two shoulders, said recess forming a guide track along a circular arc contained in a radial plane and extending angularly between said two shoulders forming counter-stops,

and wherein the stop member extends in a radial plane in immediate proximity to the radial plane containing the guide track, said stop member projecting radially to said guide track, such that the stop member is mounted to move along said guide track and is adapted to cooperate with said counter-stops to limit the relative rotation of the first frame and second frame between the first and second angular end-of-travel positions.

2. The hinge mechanism according to claim **1**, wherein the first frame comprises a first set of teeth directed radially outward, and the second frame comprises a second set of teeth formed in the annular rim, directed radially inward, the first set of teeth meshing with the second set of teeth in a radial plane containing the guide track in order to adjust the relative angular position between the first frame and second frame.

3. The hinge mechanism according to claim 2, wherein the stop member is a wedge secured within a housing provided in the first frame and the housing is formed at a periphery of the first frame in only a portion of the thickness of the first set of teeth.

4. The hinge mechanism according to claim 2, wherein the stop member is a wedge secured within a housing in the first frame.

5. A vehicle seat comprising first and second parts connected to each other by a hinge mechanism according to claim 2, the first and second frames being attached one to the first part and the other to the second part.

6. The seat according to claim 5, wherein one of the first and second seat parts is a seating part, and the other is a backrest.

7. A hinge mechanism comprising:

a first frame and a second frame mounted to rotate relative to one another about at least one axis of rotation and at least partially bounding an interior space the second frame comprising an annular rim at least partially receiving the first frame and having an axial end face,

an adjustment device adapted to allow adjustment of the angular position between the first frame and second frame,

a stop member protruding from the first frame, said stop member being at least partially arranged within the interior space, the stop member cooperating in abutment with the second frame to limit the relative rotation of the first frame and second frame between first and second angular end-of-travel positions,

wherein the axial end face of said annular rim comprises a stepped-down recess in only a portion of an axial thickness of the annular rim and extending angularly between two shoulders, said recess forming a guide track along a circular are contained in a radial plane and extending angularly between said two shoulders forming counter-stops,

and wherein the stop member extends in a radial plane in immediate proximity to the radial plane containing the guide track, said stop member projecting radially to said guide track, such that the stop member is mounted to move along said guide track and is adapted to cooperate with said counter-stops to limit the relative rotation of the first frame and second frame between the first and second angular end-of-travel positions,

wherein the stop member is in the form of a pin projecting radially outward, formed as an integral part of a radial ring.

8. The hinge mechanism according to claim 7, wherein the radial ring is integral to the first frame.

9. The hinge mechanism according to claim 7, wherein the first frame comprises an axial neck.

10. The hinge mechanism according to claim 9, wherein the radial ring is fixed to the axial neck.

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